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The Effect of Project Manager's Management Style on Project Delivery Success in Construction Projects

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Abstract

This study explores the type of management styles adopted by construction project managers (PM) in Iran and the relationship between the styles chosen and project success. A sample of 139 project management practitioners participated, and the results were analysed using robust statistical methods. The results show that although most of the PMs tend to take determined approaches, the rate of adoption of this management style slightly differs from that of the other styles. The results also present that the four dimensions of management style, namely interaction, flexible, proactive and external, would lead the projects to achieve better outcomes and increase the likelihood of success. The findings form an insight into the current practice and may be useful for PMs to improve their management abilities and skills.

Keywords: *Project Success; Management Style; Project Management; Competency*

1. Introduction

Does the PM's management style affect project performance in achieving success in construction projects? Construction project performance is dependent on its project management, hence different competences and skills are now required from project management practitioners (Garel, 2013; Ramos et al., 2016; Demirkesen & Ozorhon, 2017). The implementation of methods and techniques of project management has radically expanded in many construction companies around the world, implying the necessity for effective project management styles (Fortune et al., 2011; Mir & Pinnington, 2014).

To many researchers, PM's role is more complicated compared to functional managers' job, and their management style can affect project success (Müller & Turner, 2010; Vittal S Anantatmula, 2010). The traits that form the competencies of PMs and their effect on construction project success has continuously been investigated in the literature (Dziekoński, 2017; Zuo et al., 2018).

A PM's role in the project is often complicated and challenging since they encounter various issues that are needed to be dealt with most appropriately so that project objectives can be accomplished (Karlsen et al., 2020). When doing so, their management style may

significantly affect their decisions and performance in these situations, which will influence the project and the stakeholders' interests.

Recent research by Ramos et al. (2016), provides a good starting point for this research. They identify the current management styles adopted by the PMs and the style that might lead to better project outcomes. They have conducted an exploratory study of current management styles adopted by Brazilian PMs. In that work, the traits of PMs regarding different management styles are explored to realise if there is an adoption of, or preference for, a particular style (Ramos et al., 2016). This study follows the same method of data collection that Ramos et al. (2016) have chosen and obtains the opinions of 139 qualified project managers using questionnaires. But more importantly, this study undertakes further investigation in order to discover the effect of current professional PMs' management style on project success. The management style questionnaire was originally created by (Ramos et al., 2016), based on the four dimensions of management styles introduced by Klijn et al. (2008). Langston's (2013) 3D Integration Model is utilised for measuring project success, retrospectively, in Iranian construction projects.

This study aims to understand how different management styles can lead the project towards its planned goals and stakeholders' interests with an overarching focus on construction projects where usually massive investments are involved. By using the collected data, this study focuses on finding empirical evidence to address two research questions: (1) which forms of management style(s) do construction PMs usually draw upon in practice? And (2) which management style had often been used in more successful projects?

2. Context to the study

The literature includes several studies on the behaviour and competencies of PMs regarding the project success (Kocher et al., 2013; Zhao et al., 2016; Tabassi et al., 2016; Maqbool et al., 2017; Dziekoński, 2017; Chaudhry et al., 2019). PM's performance, knowledge, experience, competency, leadership and management style and, in general, all personal attributes and human skills can influence project success (Mazur et al., 2014).

2.1. Management Style Model

'A management style is a way of life operating throughout the enterprise and permits an executive to rely on the initiative of the personnel of an entity (Nwadukwe & Court, 2012:199)'. Utilising an effective management style by the managers when interacting with their subordinates is of high importance to team success in any hierarchical organisation

(Kocher et al., 2013). However, few studies have been undertaken to investigating the effect of management styles on project success in construction projects.

Several models of management styles have been created and developed by researchers in the literature (Ramos et al., 2016). The latest one is proposed by Olmedo-Cifuentes & Martínez-León (2014), which includes two types of management styles, namely directive and participative, as the two main sets of behaviours that PMs might adopt. The former is adopted when managers make decisions and set performance criteria, and the latter takes place when managers benefit from subordinates' views and ideas in the decision-making process (Northouse, 2019).

Although all those models in the literature can be useful, this study adopts Klijn et al. 's (2008) models since it has been proven to hold the capacity of exploring the project managers' specific characteristics (Ramos et al., 2016). Back in 2008, in a survey conducted on public-private projects, Klijn et al. (2008) identified four aspects of management style based on the literature and their previous investigations. This model was then adopted by Ramos et al. (2016) in research aiming to explore Brazilian PMs' management styles:

- *Results–interaction:* Actions are mainly aimed at achieving results or at achieving good relations.
- *Internal–external:* The orientation is more internal (the project organisation itself) or external (other actors involved).
- *Reactive–proactive:* The manager is more likely to react to other initiatives or take the initiative themselves.
- *Flexible–determined:* The PM has clear goals or adapts to new circumstances (Ramos et al., 2016:904).'

Also, Chaudhry et al. (2019) adopted this framework to examine the PMs' management styles in the software industry in Oman. The model is now being used in this research to understand how the different management styles adopted by construction PMs can impact their projects.

2.2. Project Success Model

Competency in leadership and management has been proven to be a success factor in the construction area (Blaskovics, 2014; Zhao et al., 2016; Tripathi & Jha, 2019). For the purpose of this study, the success of the sample PMs should be measured using a project success model. Many authors have proposed different types of frameworks to advance a

more solid technique to comprehend project success and what standards are dependable to be applied during these considerations (Albert et al., 2017).

Each organisation or sector, project team or manager possibly can create their own definition of project success (Turner & Zolin, 2012). For some scholars, success is a skewed occurrence and is reliant on the view of those who are gauging it since intangible benchmarks imply different facets to different people. However, Davis (2014) determined that PMs are potentially the most influential factor for project success attainment.

2.3. 3D integration model

Langston et al. (2018) proposed a method for measuring project success over time suitable for use on any type of project regardless of size, location or date. In their model, known as *i3d3*, time serves an essential role in judging project success. The *i3d3* model shown in Figure 1 comprises three common stages of 'initiate', 'implement', and 'influence', and three common targets of those stages, namely design, deliver, and delight. Stakeholder communication across these phases is crucial for guaranteeing that shared vision and purpose is sustained. During each stage, different collections of stakeholders have greater influence and interest than others regarding the project success dimension (Jiang, 2014).

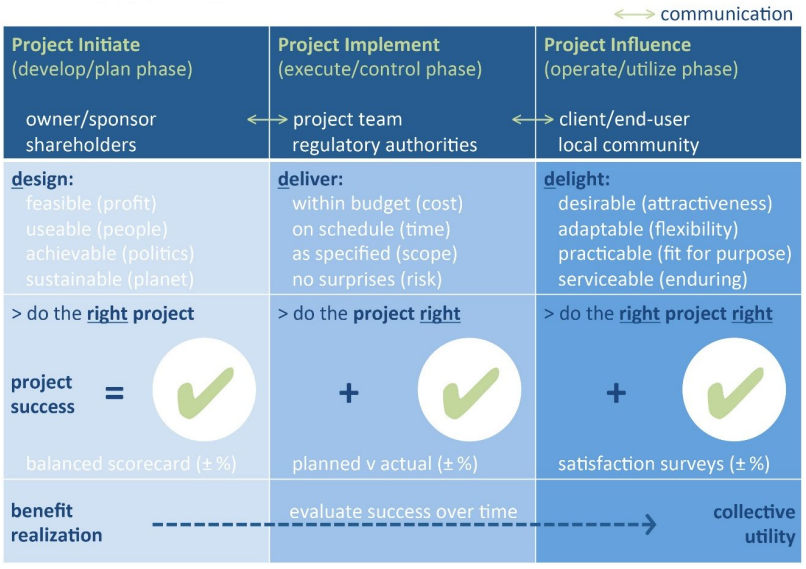

Figure 1. The i3d3 model framework (Langston et al., 2018)

For the purpose of measuring success in this paper, the middle part of *i3d3* which is called '3D integration model' shown in Figure 2 is used which has previously been introduced, developed and validated in other papers (Langston, 2013; Langston & Ghanbaripour, 2016; Ghanbaripour et al., 2017; Langston et al., 2018). The 3D integration model is made in the form of a tetrahedron and based on the ten knowledge areas of *PMBOK Guide* plus a new

area of Environmental Management. It can be used to measure the performance of the project in delivering successful outcomes at various stages in the project lifecycle through the identification of core project constraints (occupying the four vertices of the model) and six aforementioned KPIs (represented by the edges of the model) (Ghanbaripour et al., 2017).

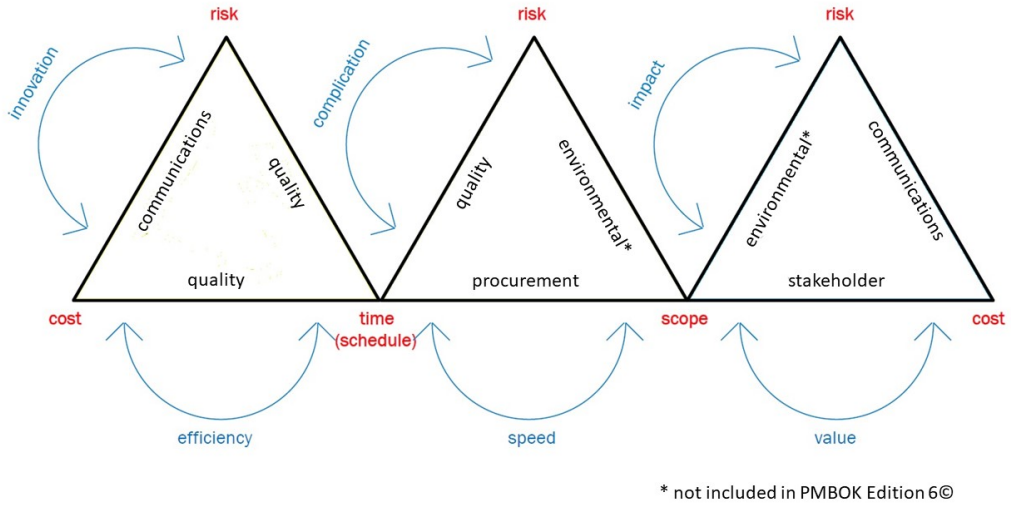

Figure 2. 3D integration model adopted from (Ghanbaripour et al., 2017; Langston, 2013)

In 3D integration model, success criteria are assessments of being on budget, on schedule, as specified and with no surprises by use of the six key performance indicators (Langston, 2013). These KPIs include value, efficiency, speed, innovation, complication, and impact described in Table 1. They can be applied to all projects at any given time in any given country and on any scale, whether large or small. Value, efficiency, speed, and innovation are maximised, whereas complication and impact are reduced (minimised).

Table 1. Six generic KPIs of the 3D integration model (Ghanbaripour et al., 2017)

KPI	**Definition and the related *PMBOK Guide*'s knowledge area**
Value	the ratio of scope over cost (objective: maximise). Value is a function of project *stakeholder management*, namely meeting expectations and fostering engagement. Scope is treated as an output and cost is treated as an input, so the more utility per unit of cost the greater is the value for money;
Efficiency	the ratio of cost over time (objective: maximise). Efficiency is a function of project *resource management*, namely team performance and leadership. Cost, in this case, is treated as an output (value of work completed) and time as an input, so the more money spent per unit of time the more efficient is the delivery process;
Speed	the ratio of scope over time (objective: maximise). Speed is a function of project *procurement management*, namely outsourcing strategies and parallel supply chains. Scope is treated as an output and time as an input, so the more utility provided per unit of time the faster is the delivery process;

Innovation	the ratio of risk over cost (objective: maximise). Innovation is a function of project *communications management*, namely knowledge management and research informed learning. Risk is treated as an output (innovation leads to development risks) and cost as an input, so a higher level of risk per unit of cost reflects the search for better ways of doing things;
Complication	the ratio of risk over time (objective: minimise). Complication (originally termed complexity) is a function of project *quality management*, namely excessive quality-assurance paperwork and engineering over design. Risk is treated as an output and time as an input, so a higher level of risk per unit of time is a sign of project difficulty that should be avoided
Impact	the ratio of risk over scope (objective: minimise). Impact is a function of project *environmental management*, namely adverse sustainability outcomes and unnecessary resource consumption. Risk is treated as an output and scope as an input, so a higher risk level per unit of utility reflects unwanted environmental disruption.

Note 1. a new area of project environmental management has been added to the *PMBOK Guide*'s existing knowledge areas to recognise the emerging importance of sustainability in modern projects (Ghanbaripour et al., 2017)

Since it is not possible to optimise all KPIs, an equation has been derived by Langston (2013) that is used to determine the best mix of success factor performance. To calculate the project delivery success (PDS), both planned and actual performance are considered. The percentage change is worked out after the completion of delivery. Overall success (calculated as the change in PDS between planned and actual performance) is given by the following formula (Langston, 2013):

$$\text{Project delivery success } (PDS) = \frac{S^3}{CTR}$$

Where *c* (cost) = the cost of implementing the project, *t* (time) = the duration of the project from start to finish, *s* (scope) = a measure of the size or extent of the project, *r* (risk) = the √mean risk level (probability x consequence) of all risk events.

A successful project is one that delivers more scope for less cost, time and risk as per the equation ($PDS = \frac{S^3}{CTR}$). In that case, the PDS is higher.

3. Methodology

3.1. Questionnaire Development

To explore the PMs' management style, a questionnaire designed by Ramos et al. (2016) is utilised to measure the respondents' tendency to each management style based on the model in (Klijn et al., 2008). Since a good number of generic statements have been made in this questionnaire which has already been proven to be capable of obtaining valuable data (Hyman et al., 2006) regarding the management styles, however, its reliability and validity are tested within the current context of Iranian projects. This structured questionnaire

includes questions asking how managers would deal with various situations using one or more of the four dimensions of management styles: Results x Interaction, Reactive x Proactive, Internal x External, and Flexible x Determined, using a 5-point Likert scale. The first section of the questionnaire collects descriptive data about respondents and their experience within the industry. The next section observes the managers' management style and asks the respondents whether they agree or disagree with the given statements within the context of the project management attributes in their organisations. The second section of the questionnaire is an opinion-based 5-point Likert survey of the PMs with the values of 1–5, where 1 indicates strongly disagree, and 5 indicates strongly agree. There are 2 for disagree, 3 for neutral and 4 for agree in between.

The second questionnaire will only obtain the planned and actual values (for cost, time, scope, and risk) of the latest project that each PM has undertaken and finished.

3.2. Validity and Reliability

In this study, the construct validity of the variables is tested to ensure accurate assessment of the management style of the construction PMs. The development of the questionnaire is based on a review of the literature, and specifically, the approaches that are taken by Klijn et al. (2008) and Ramos et al. (2016), however, it is still vital to assess the validity as the questionnaire is being distributed among a sample of managers in a completely different context. Therefore, a pilot questionnaire test is conducted.

Nine professional PMs were asked via interview to complete the questionnaire and to present a critique of the questions. Those professionals reviewed the statements one-by-one and did not rule out any of the proposed variables. Then the Cronbach's alpha coefficient is used to determine the responses' reliability.

3.3. Survey Sample

Purposive sampling was used in this study. The target population of this study was construction PMs who were involved in managing medium-sized construction projects; hence the sample comprises the views of a group of professional PMs. The authors intended to hold the interview meetings in person instead of sending out the questionnaires. Hence 112 prominent construction companies were randomly selected and contacted, and 42 of them that had construction projects running in Tehran agreed to participate in the study. An acceptable response rate of 37.5 per cent (Yong & Mustaffa, 2012) was achieved, and all 45 cooperating firms were well-known construction contractors. This process led to a sample

that encompassed 139 construction PMs. One of the authors travelled to all the construction sites in which those PMs were based and conducted face-to-face interviews. That author also gathered and investigated archival material to collect data on both management style and project delivery success areas. To obtain data on project success, planned and actual performance of the most recent project, managed by each construction PM was investigated. A diagnosis of PM attributes, performance, and management style can help practitioners to organise and coordinate projects in a clear way. We identified the style and performance of this group to understand which attribute led these projects to better outcomes comparing to others.

3.4. Analysis Method

The analysis comprises of four sections. First, the demographics of the respondents is presented. In the second section, the internal consistency reliability using Cronbach's alpha coefficients is measured to assess the appropriateness of the questionnaire. In the third section Confirmatory Factor Analysis (CFA), which is one of the powerful Structural Equation Models (SEMs) is applied to assess the relationship between different management styles, and also to assess the loading of each question in each style. These loadings are valuable measures to determine the degree of importance of a question in a questionnaire. This research investigates the hypothesised effect of adopting different management styles by PMs on project success; hence the following hypotheses are developed:

H1: The orientation of management styles have a significant effect on project success

H2: Mentioned management styles are independent.

In order to test H1, multiple linear regression (MLR) is used to find the strength of the management style's effect on project success, and to test the independence of the styles (H2) we anchor to the results of CFA analysis. Any correlation between the styles will show dependence and violation of the latter hypothesis.

The goodness of fit (Hoelter, 1983) of the parameters is presented to evaluate the strength of the model. Also, a histogram to measure the distribution of studied managers across the four styles is presented.

In the last section, multiple linear regression is utilised to measure the cumulative effect of the four styles on the success ratio of the PMs. A stepwise method is used to remove variance inflation from the styles, as there is a significant correlation between all the styles.

4. Analysis and Discussion

4.1. Respondents' Demographics

Descriptive statistics of the respondents' background has been summarised in Table 2.

Table 2- Demographics of the respondents

Items	**Construction**	
Age		
Less than 25 years	-	-
25 to below 35 years	25	18.3%
36 to below 45 years	74	52.9%
More than 46 years	40	28.8%
Experience in Subway Construction Project Management		
Less than 2 years	7	4.8%
2 to below 5 years	20	14.4%
6 to below 10 years	12	8.7%
More than 10 years	100	72.1%
Educational Background		
Bachelor of Science	80	57.7%
Master of Science	39	27.9%
MBA/ DBA	7	4.8%
PhD	13	9.6%

It reveals that slightly over half of those who responded to the survey (approximately 53%) are between 36 to 45 years old. Some researchers suggest that the approach the managers take and the decision they make may be affected by their age (Chaudhry et al., 2019; Swiery & Willitts, 2012). Most of the respondents have been involved with construction projects for more than a decade, and all of them have tertiary education.

4.2. Questionnaire reliability

Results of Kaiser's measure of sampling (KMO) adequacy are presented in Table 3. Questions Q6 and Q27 showed a coefficient lower than 0.5 and were removed from the analysis.

Table 3. Kaiser's Measure of Sampling Adequacy (KMO)

Result vs Interaction		**Reactive vs Proactive**		**Internal vs External**		**Determined vs Flexible**	
Q1†	0.845	Q10†	0.81	Q17†	0.757	Q23	0.921
Q2†	0.798	Q11	0.807	Q18	0.818	Q24	0.893
Q3†	0.758	Q12†	0.829	Q19	0.772	Q25	0.86
Q4	0.845	Q13	0.772	Q20†	0.69	Q26	0.829
Q5	0.802	Q14†	0.85	Q21	0.738	Q27*	0.356
Q6*	0.488	Q15	0.815	Q22†	0.736	Q28†	0.875
Q7	0.818	Q16	0.723			Q29†	0.852

Q8	0.845
Q9†	0.869

†: These questions were reversely coded
*: Questions 6 and 27 were removed as a result of low KMO coefficient

Results of the Cronbach's Alpha shown in Table 4 reveal that two questions in the questionnaire cannot explain the idea behind their associated management styles. As for Q6 asking about 'Result vs Interaction', it led to a low alpha value of 0.703 (Bonett & Wright, 2015). This question is removed, and the calculated alpha has increased significantly to 0.786. A look at Q6, 'I follow the activities delegated by me', shows whether a manager is result-oriented or interaction-oriented. She or he might follow the activities delegated to anyone, as these activities can both have an effect on the conclusion and at the same time, need interaction

Regarding the fourth style, 'Determined vs Flexible', removing Q27 also triggers a substantial improvement to the reliability of the questionnaire. With the deletion of this question, Cronbach's alpha of the fourth style increases from 0.709 to 0.79. This question states 'I believe the project will be completed despite the obstacles' which can receive the same answer from both Flexible and Determined managers. The variance of this question was very low, and both groups of managers (Flexible and Determined) selected choice 3 or above.

Table 4. Cronbach's alpha of the four studied management styles

Management Style	**Cronbach's Alpha**
Result vs Interaction	0.786*
Reactive vs Proactive	0.8
Internal vs External	0.753
Determined vs Flexible	0.79*

Note 2. Cronbach's alpha of the two management styles were 0.733 and 0.729 before the removal of Questions 6 and 27, respectively

4.3. Management style relations and adoption rate

Goodness of fit statistics in Table 5 shows that the model is well fitted. The Chi-square model is significant at 0.001 level, and the number of filled questionnaires (139) are well above the Hoelter's critical N index (Hoelter, 1983) that suggests a minimum of 125 questionnaires. The standardised root means square residual (SRMR) is also below 0.08, which shows good fit. However, the AGFI criteria are below 0.9, indicating that the questionnaire needs more improvements to get better results.

263 Table 5. Fit parameters of Confirmatory Factor analysis

Baseline Model Chi-Square	1314.111
Degrees of Freedom	351
P-value	0.001
Hoelter Critical N	125
Standardised RMR (SRMR)	0.0649
RMSEA Estimate	0.043
Adjusted GFI (AGFI)	0.8004

264

265 Factor loadings in Table 6 illustrate that each factor (style) can define more than 50% of each
266 question variance. Except for questions 1 and 22, more than 60% of the variance of the
267 remaining questions were well defined by the factors. Questions 5, 10, 11, 13, 20, 23, and 25
268 can extract the style of the PMs very well as their factor loadings are above 80%.

269 Table 6. Factor loading of questions in each style (All loadings are significant at 0.001 probability level)

Result vs Interaction		**Reactive vs Proactive**		**Internal vs External**		**Determined vs Flexible**	
Q1	0.581	Q10	0.841	Q17	0.739	Q23	0.892
Q2	0.785	Q11	0.865	Q18	0.785	Q24	0.686
Q3	0.63	Q12	0.779	Q19	0.763	Q25	0.865
Q4	0.722	Q13	0.865	Q20	0.806	Q26	0.791
Q5	0.841	Q14	0.78	Q21	0.793	Q28	0.783
Q7	0.645	Q15	0.707	Q22	0.505	Q29	0.793
Q8	0.7868	Q16	0.644				
Q9	0.663						

270

271 Factor correlation analysis shows a significant correlation between all the studied
272 management styles. Using Confirmatory Factor Analysis (CFA) instead of Exploratory
273 Factor Analysis (EFA) enabled the research to measure the correspondence strength between
274 the styles. The fourth style, 'Determined vs Flexible' had the highest correlation with other
275 styles, especially 'Result vs Interaction' and 'Reactive vs Proactive'. This high
276 correspondence shows that there is a close relationship between these styles. In other words,
277 those managers who are more flexible, also tend to be more interaction-oriented and
278 proactive, and a bit more external-oriented leaders (Table 7).

279 Table 7. Factor correlation coefficients (All coefficients are significant at 0.001 probability level)

	Result vs Interaction	**Reactive vs Proactive**	**Internal vs External**	**Determined vs Flexible**
Result vs Interaction	1			
Reactive vs Proactive	0.351	1		

Internal vs External	0.361	0.337	1	
Determined vs Flexible	0.696	0.738	0.563	1

Since there is no definite border between the two dimensions in all four styles, these should be analysed in a spectrum to investigate the tendency of managers to each style. A histogram in Figure 3 indicates the distribution across the spectrum in all four styles. Based on the results, roughly around 7% of the managers were neither result-oriented nor interaction oriented; however, 44% of the managers are result-oriented, out of which, about 5% are extremely result-oriented. On the other hand, 49% of the managers are interaction-oriented, out of which, about 3% are extremely interactive. The highest proportion of managers (21%) were moderately interaction-oriented.

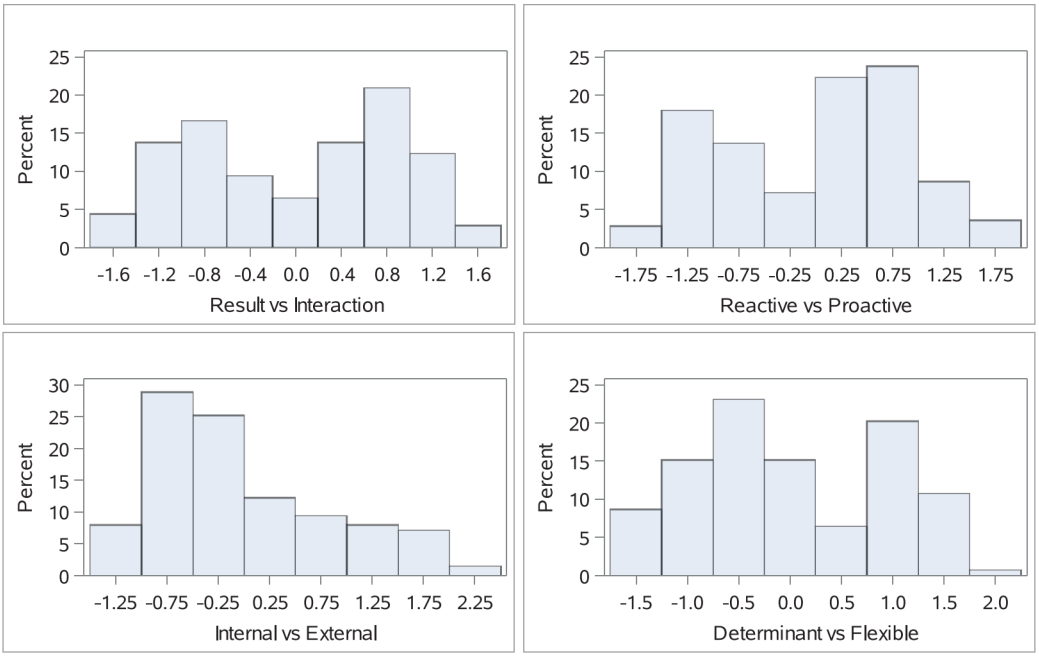

Figure 3. The adoption rate of the management styles by the sample PMs

'Reactive vs Proactive' histogram shows that most of the managers are moderately proactive (47% in two columns of 0.25 and 0.75), and 13% are highly proactive. The remaining 40% are reactive managers. The third histogram, 'Internal vs External', shows that most of the Iranian managers tend to focus on internal matters of the project. About 54% of the managers are moderately internal-focused managers; however, the skewness of the data shows that a minor fraction of the managers (2%) extremely focus on external factors of the project and a small portion of them (7%) are highly external-focused. In total, 62% of the managers were internal, and 38% were external. The final histogram shows that a considerable portion of the

managers are neither Determined nor Flexible (15%), however, the highest proportion the managers were mildly Determined (23%) and 24% of the managers are moderately to highly Determined. On the other hand, only 6% of Iranian PMs are mildly Flexible, and about 32% are moderately to highly Flexible. In total, most of the managers are Determined. Figure 4 Depicts the path diagram of the management styles.

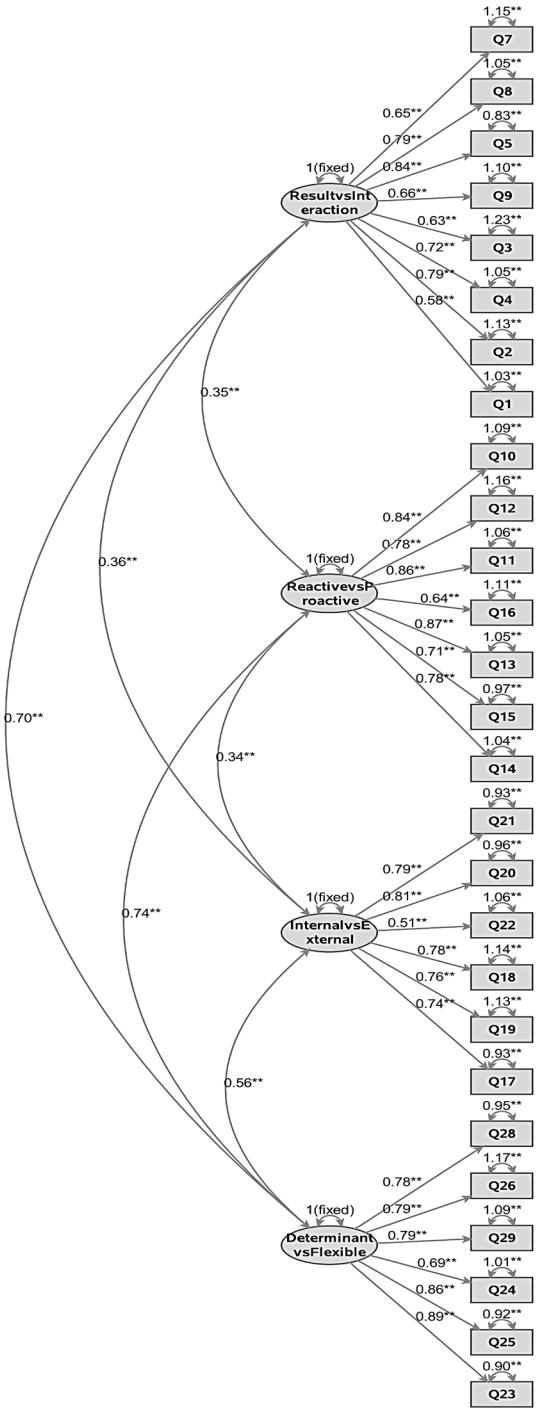

Figure 4. Path diagram of CFA analysis (**: statistically significant coefficients at 0.01 alpha level)

4.4. *Relationship between Management Style and project success*

This section investigates the effect of the management styles adopted by the PMs on the project delivery success. Many researchers have shown that appropriate behaviours, the leadership and the management style of the PMs affect the project success (O Sheedy & Sankaran, 2013; Sebastian-Ion Ceptureanu, 2016; Aga et al., 2016).

As mentioned before Langston's 3D integration model is used to measure the project delivery success (PDS) score for each of the sample projects. Table 8 shows an example of calculation of the PDS score for one of these projects. The main element of scope for this project was 2500 m^2 of floor area, and it was supposed to be constructed within 12 months with a planned $8 million of budget. The risk number was retrieved from the risk register by taking the square root of the average risk level of all the risk events.

Table 8. Example of PDS calculation

INPUTS	PLANNED	ACTUAL	UNIT
Scope (s)	2500	2500	m^2 (floor area)
Cost (c)	8,000,000	8,760,000	USD
Time (t)	12	11	months
Risk (r)	2.19	1.85	√mean risk level
Good job! (PDS ≥ 0)		**PDS = 17.94%**	

Factor correlation with the success rates (PDS scores) shows that the 'Reactive vs Proactive' style has the highest positive effect on management success. In other words, PMs with more proactive style achieved better outcomes compared to the managers who mostly adopted a reactive style. Similarly, managers who are more flexible in their projects turn out to be more successful in their projects. The same pattern applies to the managers with interaction-focused leadership style. Finally, managers with higher external attitude have a slightly higher success rate compared to the internal ones, and the relationship is weaker than the former styles.

Looking at the results of the CFA analysis, negative factor values are considered for the right-hand side of each style (Result, Reactive, Internal, Determined) and vice versa. Table 9 shows that for managers with result-oriented style, the average success of the project is 26.3% compared to 59.2% in interactive managers. Furthermore, reactive managers have roughly 43% lower success in their project compared to proactive managers which is the highest difference among the four styles. Internal and rigid managers also have 21 and 40% lower average success, respectively.

Table 9. The average PDS score of PMs in each style

Average Success Rate (PDS Score)			
Result =>	26.3%	59.2%	<= Interaction
Reactive =>	18.2%	61.3%	<= Proactive
Internal =>	35%	56.1%	<=External
Determined =>	24.9%	65%	<=Flexible

The multiple regression results in Table 9 shows that the management styles can explain 34% of the successfulness of a PM. The model was significant at 0.0001 level with an F value (The F value is the ratio of the mean regression sum of squares divided by the mean error sum of squares) of 18.76. The positive correlation between success and all four styles are shown in Figure 5. As can be seen, with an increase in the style scores towards the positive ones (Interaction, Proactive, External, Flexible), the success rates increase significantly.

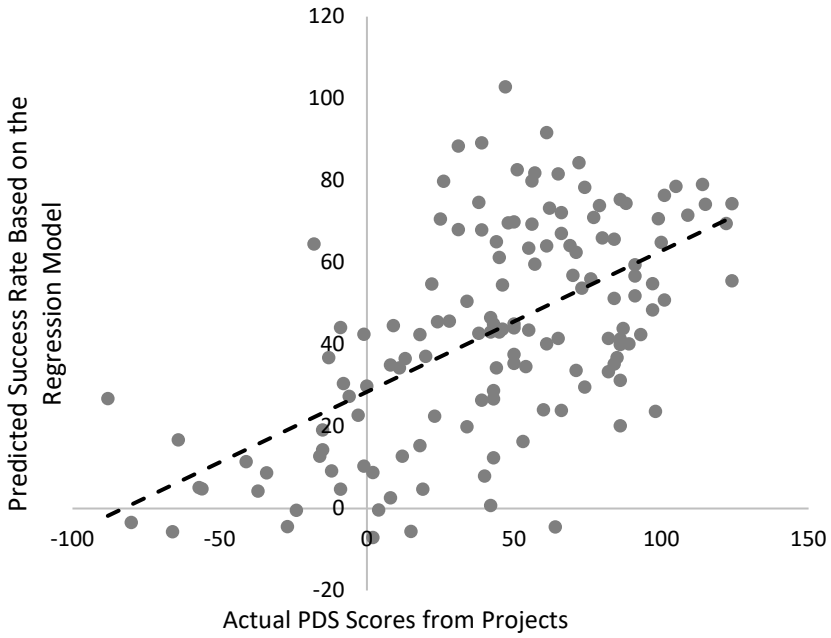

Figure 5. Scatter Plot of Actual against Predicted Success Rate.

4.4.1. Results x Interaction management style

The results from Table 9 suggest that those PMs who had adopted an interactive management style did better in delivering their projects. The results are in line with the outcome of many other studies. Prabhakar (2004) undertook research on 153 projects across 28 countries and concluded that PMs who were relationship-oriented generated more successful projects. As the business environment becomes more competitive, PMs must deal with more complex

projects. Hence, interactive management styles relying on strong group interactions among the project team are required to effectively deal with new interconnected, non-linear and difficult-to-define problems (Thamhain, (2013). In construction projects that are generally massive and complex, a PM that inspires and motivates the team members is more likely to achieve success (2019).

PMs spend approximately 90% of their time on communicating and interacting with internal and external stakeholders of the project and to ensure a successful project effective and interactive management to build better relationships are required (Maqbool et al., 2018). Additionally, adopting an interactive management style may lead to more successful projects as it enables a trustful interaction between individuals and boosts team-building by establishing more effective communication among the team members (Aga et al., 2016) Apart from the strong connection it generates internally between superiors and subordinates, an interactive project management style helps to develop a collaborative relationship with external stakeholders of the project to ensure that the outcomes are what they require (Rasmussen et al., 2013).

4.4.2. Proactive x Reactive management style

Table 9 indicates that similar to interactive management style, being proactive makes a significant difference in terms of successful delivery of the project since it is a key success factor especially in dealing with complexities and ambiguity (Hagen & Park, 2013; Larson & Gray, 2014; Maqbool et al., 2018). For instance, PMs can be proactive by providing the team with adequate training, responding to issues and risks systematically, clarifying expectations and setting the goals and standards to maintain consistent performance improvement to secure project success (Bond, 2015). Chaudhry et al. (2012) state that the project team automatically adopt a proactive style of the PM which will be beneficial to the project's performance. Looking at the role of the PMO in organisations, implementing proactive processes can help projects run more efficiently, finished within budget and up to the standards. Also a proactive PM maintains open communications with stakeholders which is a key factor to mitigating the project problems and to managing their expectations before surprising and detrimental change requests are proposed (Cuthbert Andy, 2012).

4.4.3. Internal x External management style

According to Klijn et al. (2008) project management is mainly focused on controlling the project internally and is less concerned with a continual interaction with the external

environment. Various internal and external factors affect construction projects which can significantly affect their performance (Adeleke et al., 2019). Some researchers hold the opinion that a PM should undertake the project both efficiently and effectively. The former refers to internal requirements such as cost, asset utilisation, etc. while the latter comprises satisfying or exceeding the stakeholders' requirements (Sundqvist et al., 2014). Zhao et al. (2016) explored the leadership characteristics of PMs in Singapore and suggested that these two styles should be adopted together to achieve better outcomes in projects.

The study's results show that focusing more on external factors of the project may slightly improve the project's outcomes, and this difference is not significant. Peters & Waterman (2015) revealed that successful large companies had achieved better outcomes by focusing on the internal processes and the development of intrinsic motivation of the employees. Similarly, in research focusing on factors contributing to the organisational success of the construction subcontractors, Thomas Ng et al. (2009) concluded that the top five of the critical success factors are all internal factors on which the most of the PM and team's attention is required. However, the impact of the external factors on project success can be significant, which may cause cost and time overruns leading the project to failure (Gunduz & Yahya, 2015). For instance, early termination of a project, no matter why it has been terminated, can be deemed as a failure. The external factors contributing to this theoretical failure may include legal, political, environmental or social setbacks (Nixon et al., 2012).

4.4.4. Flexible x Determined management style

As can be seen from the results, managers with more Flexible management style have achieved better outcomes. Flexible management style is recognised as a prominent characteristic of effective project management (Pace, 2019). Researchers have listed several advantages of this kind of management style including but not limited to: creating a common sense of responsibility among team members for success; generating more effective communications among all internal and external stakeholders; easier implementation processes due to earlier identification of the issues; developing creativity and innovation; better access to information; more acceptance to beneficial changes, etc. (Kaufman, 2011). This type of management style has been adopted by emotionally intelligent leaders who utilise it to create an environment where team members feel their innovations and initiatives are embraced by the managers (Brinia et al., 2014).

A Flexible project management style from a long-term perspective can be considered as critical success factor that will improve the overall effectiveness of the projects as well as the stakeholders' satisfaction (Shahu et al., 2012).

5. Conclusion

A thorough review of the literature in this paper reflected that the PM's management style could affect project success either positively or negatively. The purpose of this research was to explore the management styles adopted by PMs in construction projects in Iran and more importantly, to investigate the relationship between the four types of management style and project success based on the Klijn's management dimensions (Klijn et al., 2008) and the Langston's 3D Integration Model (Langston, 2013) respectively. Generally, in diverse situations and circumstances, managers might adopt different styles (Kocher et al., 2013). The results of this study indicated that although there is no single 'best' choice of management style and it is difficult to discover the main style adopted by the target managers, one of the dimensions of each style had led the project to considerably better outcomes comparing to the other dimension. However, the analysis of the histograms in Figure 3 indicates that the 'determined' style is the favourite style of most managers. Conversely, the second part of the research identified 'Flexible', 'Proactive', 'External' and 'Interaction' dimensions as the better management styles in achieving more successful outcomes in construction projects.

The results of this research can contribute to the advancement of the knowledge in both academic field and professional practice since the findings of the management styles leading to better project outcomes are relevant to understanding the most effective project management methods. From a professional point of view, the findings of this study can be utilised by the construction PMs should they are keen to improve their management skills and look for better performance to increase the likelihood of success in their projects. Management style remains an exciting topic for the construction sector; hence further studies to investigate its impact on project performance in various countries is suggested. Also, other management style models can be adopted in future studies to compare the results with those of the Klijn et al.'s (2008) model. This will enable managers to take better decision making approaches and adopt more effective management styles that more consistently lead to better outcomes.

6. Limitations

The limitations of this study stem from the data collection process. Firstly, all the planned and actual data obtained to measure project success were related to the last project that each PM had conducted and finished. The authors tried to ask the respondents about the management styles they normally adopt; however, a few PMs might have changed their attitudes and methods since the last project. Secondly, although the authors attempted to maximise generalisation of the results, the number of PMs working in the construction industry in Iran were not clear. Thus the study could not select a sample based on the probabilistic methods, so the authors reached out approximately 250 professionals via telephone and 139 opted voluntarily to participate. However, the number of respondents is sufficient for the statistical methods used.

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